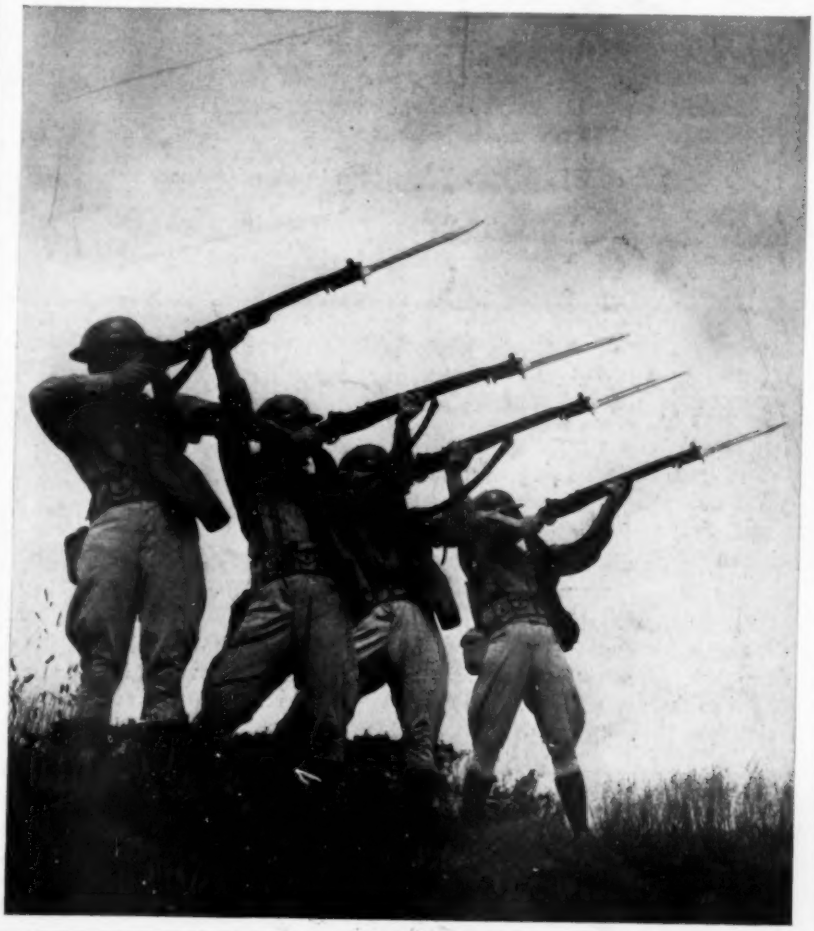
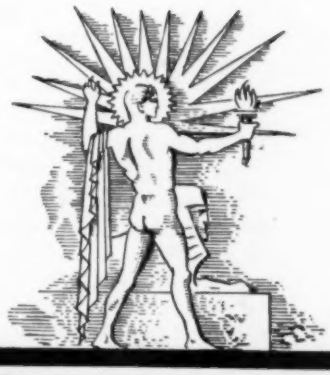
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





September 23, 1939

Modern Death

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A SCIENCE SERVICE PUBLICATION

Do You Know?

Fifteen hundred omnibuses in Italy are fueled with methane, or marsh gas.

About half the varieties of trees found throughout the States grow in Florida.

The African warthog keeps its eyes on possible danger, even backing into its home.

There are now fewer than 50,000 Germans in the colonies formerly owned by Germany.

"Wool" made from milk resembles sheep's wool more closely than rayon resembles silk.

In 23 years, births of 70 sets of quadruplets have been reported in the areas of the United States that register births.

The mystery of how a hen produces the calcium for egg shells has been explained: gland mechanisms control the process.

Napoleon III had hopes of using aluminum to lighten his soldiers' equipment load, but it cost several hundred dollars a pound.

British engineers have designed a cubicle big enough for bed, chair, and table which may be air conditioned to provide comfort in the tropics.

A one-coat finish which can be sprayed on all-metal transport planes is a weight-saving device, as it adds only 15 pounds in contrast to the 40-pound limit allowed for paint.

Towns in Roman Britain rarely had more than 5,000 people; London perhaps had as many as 15,000.

The automobile industry salvages about a million tons of waste materials each year, involving savings of more than ten million dollars.

There is no basis for the notion that saturating the system with iodine will keep hair from turning gray and give it a reddish brown tinge, says the American Medical Association.

A process of melting unbreakable watch crystals into place is said to seal the crystal in permanently with dust-proof tightness.

Italy figures that she can save 50,000 tons of coal by using rice wastes as fuel.

Japan is short on dyestuffs as a result of drastic curtailment of imports.

Superstitious folk gave the witch hazel plant its name, in awe of supposed powers of a plant that blooms late in autumn and ripens its fruit in spring.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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PSYCHOLOGY

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PUBLIC HEALTH

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SCIENCE NEWS LETTER

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MEDICINE

X-Ray Burns Healed, Cancer Prevented By New Method

International Cancer Congress Hears Of New Research Into Possible Causes and Cures of Dread Disease

X-RAY and radium burns of many years standing have been healed and probably kept from turning into cancers by a method reported by Dr. Erich Uhlmann of Chicago at the International Cancer Congress meeting in Atlantic City.

Effective cancer treatment may even result from modification of the method used to treat these dangerous sores, which are the same kind that claimed the lives of many of the X-ray pioneers. Dr. Uhlmann said that he is now working at an adaptation of the method to cancer treatment.

The treatment is a combination of alpha rays, beryllium and boron. Skin burns and ulcers, produced by X-ray or radium treatment, which failed to heal in spite of many kinds of treatments over a long period, "healed completely in a short time" under this new form of treatment, Dr. Uhlmann reported.

Ten-year cures of both the ulcers and of some which had started to become cancers were reported. The cancers were not healed by the treatment but their growth was definitely retarded. They were then removed by cold cautery (dry ice). Following this the wounds and the original injury healed "in a surprisingly short time" and there have been no recurrences in the ten years since the treatment.

Dr. Uhlmann suggests that either neutrons or secondary alpha rays may be responsible for the success of the treatment. Beryllium is the greatest source scientists now have for the fast neutron rays. Bombarding beryllium with deuterons in the cyclotron or making it into a bomb with radon gas from radium will produce neutrons. Apparently Dr. Uhlmann stumbled on this last method of making neutrons long before these powerful rays had actually been discovered.

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Hope For Vaccination

CONQUEST of cancer by vaccinating against it seems closer to reality today as a result of experiments reported to the Congress.

Mice have been made resistant to cancer by giving them a complex substance called a chemoantigen, Dr. W. R. Franks of Toronto reported. In London, England, Dr. William Cramer has immunized mice against skin cancer and Dr. Thomas Lumsden has discovered in the blood of many cancerous animals a poisonous substance which kills cancer cells under certain conditions, they reported.

Dr. Franks produced cancer resistance in his mice by linking cancer-causing chemicals with casein, the protein of milk. He reported a "significant reduction in tumor production," when this substance was given before cancer-causing agents were set to work in the animals' bodies.

The anti-cancer vaccination experiments have so far been limited to laboratory animals and it may be a long time before any such results can be achieved with humans, if they ever can be.

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See Cells Become Cancerous

THE SEARCH for a chemical to cure cancer has been advanced by the discovery of a cancer indicator which lets scientists see under the microscope the cells that are becoming cancerous.

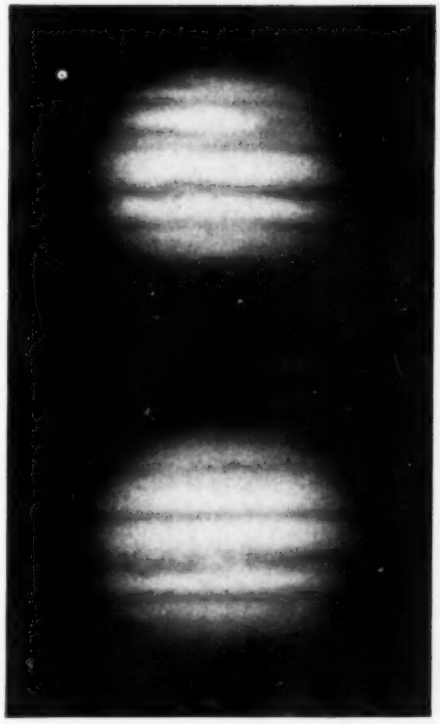
The indicator was demonstrated by Prof. Albert Dustin of Brussels. It is the old-time gout remedy, colchicine, obtained from the meadow saffron. It has no practical value as a cancer test, but it has opened new fields for research on cancer and also on gland action and other unsolved medical problems.

Colchicine speeds up the division of certain types of cells into new cells. It also has the power to halt this cell division at one stage, called the metaphase. It is this double effect of the drug that lets scientists see the cancer cells under the microscope when they are becoming cancerous.

It is important to look at just the right time to see this take-off into cancer, Prof. Dustin found. Cancer-causing chemicals are first injected into rats or other laboratory animals. Then colchicine, the indicator, is injected, to speed up the division of the cells. Between 7 and 10 hours, no more and no less, the cells are arrested in their dividing. This is the time when the scientist can see that the cancer cells are ready to proceed to abnormal division, and normal cells are ready to go on dividing normally.

If a chemical is ever found to cure cancer or to prevent it, it probably will have to achieve its effect on the cells at this stage of their lives. Colchicine, the indicator that shows up this stage, will, it is believed, show whether or not the proposed chemical cure is having any effect on the cancer cells at this crucial period.

At this same period of division, cells are most vulnerable to the destructive action of X-rays. Colchicine, which speeds up cell division so that many more cells are in the dividing stage, promises to make X-rays more effective in cancer treatment. By giving colchicine



JUPITER DRAWS NEAR

Jupiter, biggest of all the planets and over 314 times as heavy as the earth, makes its nearest approach to our planet in 24 years on Sept. 27. On that date Jupiter will be 367,110,000 miles away. What Jupiter looks like in large telescopes is shown in these photographs made at Lowell Observatory. The streaks which run across Jupiter's visible surface have no fixed patterns. They change from time to time. Their cause is still one of astronomy's mysteries.

to rats some 12 to 18 hours before X-ray treatments, cell division figures accumulated from 10 to 100 times the normal and X-rays applied toward the end of such periods of arrested cell division were more effective than in animals that had no colchicine. These studies and others showing that X-rays were more lethal to cancer cells after colchicine treatment were reported by Drs. M. F. Guyer and P. E. Claus of Madison, Wis.

Science News Letter, September 23, 1939

Glands Prevent Cancer

CANCER-SUSCEPTIBLE women may be protected against cancer by proper gland treatment, if the theory elaborated in a report from Dr. William Cramer of London, England, can be put on a practical basis.

Statistical investigations have already shown that some women inherit a susceptibility to breast cancer. A number of scientists suspect that breast cancer in women is due to the presence of too much of the female sex hormone in their bodies. It is known that injections of this female sex hormone will produce breast cancers in mice.

Dr. Cramer suggests that in women an excess of female sex hormone with cancer-causing power may arise if glands other than the sex glands are disordered. Both the pituitary gland in the head, for example, and the adrenal glands influence the sex glands.

If these other gland disorders can be detected and corrected, the women might be protected from cancer which would otherwise develop.

Science News Letter, September 23, 1939

Virus Cause of Cancer?

CAN cancer be caused by a virus, the kind of ultra-microscopic substance that causes infantile paralysis, influenza and other baffling ailments? The case for and against this theory of cancer cause was debated by leading English and American authorities on cancer and on viruses.

The idea should be given very careful attention, declared Dr. C. H. Andrewes of London. He pointed out that viruses are now accepted as the cause of some tumors in animals. There is no proof yet, he stated, that viruses are concerned in the cause of cancer in general, but the viruses have properties which fit them for the role of cancer-causing agents and they should therefore be given further study in this connection.

On the other hand, Dr. James B. Murphy of New York City gave as his opinion that there is no justification for the idea that there is one "universal virus" which causes cancers. Investigation of the viruses which cause tumors in animals is, however, interesting and important, he pointed out.

Chief point against the idea that human cancer is caused by a virus is the failure so far to find a filterable substance such as a virus in tumors of mammalian animals (mouse or man) which can cause tumors when injected into other animals. This point was stressed by both Drs. Murphy and Andrewes.

Whether or not viruses cause cancer in man, they may provide the best lead to discovering the nature of "directive factors" in the life processes of both normal and cancer cells, and thus perhaps to discovery of what directs a cancer cell to become cancerous. This suggestion was made by Dr. W. M. Stanley, of the Rockefeller Institute at Princeton, N. J., the scientist who succeeded in isolating some viruses in the form of crystalline, non-living protein matter.

The viruses represent a key to abnormal tissue changes, he said, and because many viruses are now available in essentially pure form for study, investigation of them may give scientists the key to the abnormal tissue change that is cancerous.

Science News Letter, September 23, 1939

Tobacco and Cancer

BOTH coffee and tobacco contain tars which can cause cancer, Dr. Angel H. Roffo, of Buenos Aires, Argentina, has found. Some of the tars he extracted from tobacco caused cancer when painted on rabbits' skins in 100% of the animals. Most active cancer-causing tars were obtained from Turkish, Egyptian, Kentucky and twist tobaccos. Tars of tobaccos from Havana, Italy, Paraguay, Germany and Salta were not so active but even these caused cancer in more than 50% of the animals treated. Dr. Roffo estimates that the average smoker in 10 years applies more than 8 quarts of tobacco tar to the tissues lining his breathing apparatus.

Coffee drinkers need not fear getting cancer, Dr. Roffo reassures us, because the cancer-causing substances in coffee tar do not dissolve in water and so cannot get at human tissues to damage them.

Science News Letter, September 23, 1939

The California Institute of Technology has a "dust-storm machine" for sorting soil particles according to size.

PUBLIC HEALTH

Food Deficiencies Will Be Increased by Pinch of War

FOOD is essential in war. It can almost be considered a munition, in these days when there are no non-combatants. In the warring countries, hemmed in by armies, navies, and air fleets, food will become less plentiful and less adequate to proper support of human life.

Just as war tightens belts, there is a growing realization that even in the most peaceful and prosperous days millions in the leading nations, our own included, do not get enough to eat of the proper food. The world is chronically undernourished, to the great aid of disease and unrest.

"We now know that faulty diet is responsible for a great deal of disease, ill health and physical disability which in the past were regarded as normal and inevitable," wrote Sir John Orr, director of the Imperial Bureau of Nutrition, Aberdeen, Scotland, in one of the papers undelivered before the British Association for the Advancement of Science at its Dundee meeting when war blacked-out its sessions.

Up until a few years ago we did not know enough to assure good food to every one. Now, as Sir John Orr says, the center of interest in nutrition has moved from physiology to economics. There is difficulty in getting the new knowledge applied under economic conditions which grew up before the knowledge was available.

Studies in Great Britain show that the diet of the poorer half of the population is deficient and becomes more deficient as family income falls. The kind of diet in common use among the poorest 25% of the population is deficient in nearly every constituent necessary for health with the exception of carbohydrates and fats. Much the same story can be told about other nations. Germany is probably much worse off. We are somewhat better situated, although we have our famous "one-third of a nation" ill fed.

In peace times the diet is faulty in "protective" foods, such as milk, dairy produce, eggs, fruit and vegetables. Consumption of these should be doubled.

Under the pinch of war, despite regimentation that may iron out inequalities and actually give a better diet to the lowest levels, the advance of nutrition to mankind's betterment will undoubtedly be given smashing blows.

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PSYCHOLOGY

Damage to Frontal Lobes Fundamentally Alters Mind

Abstract Thinking Is Impaired Even When Damage Is To Only One Lobe; Class System of Rats Also Reported

CHALLENGING the idea that a head wound injuring the frontal lobes of the brain could leave the victim unimpaired in intelligence, Dr. Ward C. Halstead, of the Otho S. A. Sprague Institute of the University of Chicago, told psychologists that such an injury would cause "fundamental alteration" to the personality. Dr. Halstead's report was made to the American Psychological Association meeting at Stanford University.

Scientists have recently claimed that surgical removal of even the whole frontal lobe area left patients with normal or improved I.Q. Such conclusions, Dr. Halstead declared are "based on inadequate methods" or standards.

One type of abstract thinking, involving the sorting of objects into categories on an abstract basis, is "relatively unavailable," Dr. Halstead said, for the person who suffers a frontal lobe injury regardless of which frontal lobe is damaged.

Dr. Halstead's conclusions are based on a four-year study at the University of Chicago Clinics. It is only recently that such experimental studies of brain injury effects have been undertaken, he pointed out, although analyses were made of World War gunshot brain injury cases.

Scores on an object-sorting and memory test obtained by 10 persons with frontal lobe lesions were compared by Dr. Halstead with the scores of 12 persons with lesions in the back part of the brain and with 11 normal individuals.

Those with the frontal lobe injuries found only a few categories into which to sort the objects, found it difficult to shift to alternative ways of grouping, had more difficulty in recalling the grouped objects than did either normal persons or those with other types of brain lesions.

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Six Artistic Factors

WHETHER your child will have artistic talent depends upon six factors, only three of which are strictly hereditary, Dr. Norman C. Meier of the University of Iowa told the meeting.

Manual skill or craftsman ability, volitional perseveration, and aesthetic intelligence are the three hereditary factors that set the limits to artistic ability. The other three — perceptual facility, creative imagination, and aesthetic judgment—while primarily acquired are to some extent conditioned in their development by special inheritance which sets the frame for learning.

Science News Letter, September 23, 1939

Braille for Word Blind

BRAILLE, the language of the blind, can open the door of the world of printed literature to those who are blind only in their inability to "see" words, Dr. Grace M. Fernald of the University of California revealed.

In learning Braille, she found, the word blind slightly surpassed the "control group." In all cases, word blind subjects could then learn to read Braille with the use of only the eyes even when they were still unable to read printed words.

Emotional instability is characteristic of all word blind individuals studied, Dr. Fernald said.

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Escape From Fear Teaches

RATS scurrying away on hearing a warning signal, as humans have learned to run to shelter at an air raid siren, demonstrated to psychologists at the meeting the potency of relief from anxiety as a means for "stamping in" the learning of certain lessons.

Psychologists have recognized how powerful fear is for inhibiting or restraining the frightened one. Escape from fear, Dr. O. H. Mowrer, of Yale's Institute of Human Relations, told the psychologists, is also powerful in determining the course of new behavior.

When the rats in Dr. Mowrer's experiments were given a warning of impending punishment and allowed to escape from its threat, they learned better than with the aid of the punishment itself.

"Human beings can take either of two courses of action in a danger situation," said Dr. Mowrer in discussing the human implications of his research with a representative of Science Service. "They can act in such a manner as to reduce the danger, or they can act in such a way as to reduce only their perception of the danger, that is their fear.

"The first type of behavior is rational, the second type is irrational."

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Rats Develop Caste System

RATS enacting the drama of a developing class system were the stars of a motion picture film also presented to the meeting by Dr. Mowrer.

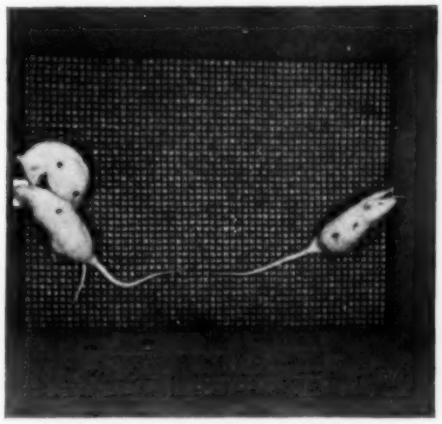
The first scene of the film showed three litter-mate rats taught by Dr. Mowrer to "earn a living" by pushing on a bar which automatically delivered a small pellet of food in a nearby food box.

Next the pay of the worker was reduced by moving the bar to the other end of the cage. Or rather, more work had to be done for the same pay.

When all three rats were placed in the cage together a "social problem" developed, for the animal doing the most work had the smallest chance of securing what he "produced." This discouraged all the animals. Total production was low.

Ravenously hungry on the third day, the animals began angrily to attack the bar, and this led to the solution of the problem. The solution was found when one animal became willing to produce so much that the others were satiated and he was fed, too.

Scores: animal Number 1, pressed bar



"CASTE" AMONG RATS

The rat at the right has become one of a "working class" and repeatedly works the bar to feed the "social parasites" who are eating the rewards of his labor at the feed box on the left.

3 times; Number 2, 0 times; Number 3, 1156 times.

Rat number 3 continued as the worker; the others became completely parasitic.

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Birth Injuries Hurt Mind

MENTAL disease in youth and early adult life in many cases is apparently due to brain injuries at birth, Dr. Barney Katz, of the University of Southern California, told the meeting.

Comparing the family histories of 100 mental patients suffering with dementia praecox (schizophrenia) and progressive mental deterioration with those of 100 persons in good mental and physical health, Dr. Katz found that difficulties of birth were much more common among the mentally diseased.

Science News Letter, September 23, 1939

Nervous Breakdown Causes

NOISE and imprisonment, as well as the dilemma of trying to make a correct decision when there is no right way, may be contributing causes to nervous breakdowns in rats. And what is true for rats may be true for men.

Dr. Norman R. F. Maier, University of Michigan psychologist, last winter gained recognition and $1,000 prize for causing rats to have nervous breakdowns. An animal was forced to take some action when there was no right way to do it. The driving force used in his experiments with rats was a jet of air.

Now Dr. Maier finds the noise of the air jet is a contributing factor in the breakdown. When the rats were placed on a small table and keys were jingled, the noise produced violent activity in 85%; the sound of an air jet caused it in 64%. In some cases convulsions accompanied the extreme activity.

Confinement is also a factor. When the rats were placed during the experiment in a closed wooden box, they were affected more than in a transparent box which, Dr. Maier said, is psychologically less confining.

But Dr. Maier sticks to his original conclusion that only the theory that breakdown occurs when a conflict is faced from which there is no escape but in which it is necessary to take action, is broad enough to cover all the cases.

Science News Letter, September 23, 1939

Insects prey on other insects for food only, says an entomologist; there is no enmity between different species.

RARE MINERAL "SEES DOUBLE"

Seeing double, usually associated with holiday libations, is possible any time if you have a crystal of Iceland Spar. This photograph shows what it will do to a page of the SCIENCE NEWS LETTER (enlarged). The mineral is widely used in microscopic work.

MEDICINE

Brain Operations Restore Control of Muscles

BRAIN surgery now promises to conquer two distressing kinds of ailments that have hitherto largely defied medical science.

The conditions are: 1. The tremors or palsy of fingers and toes which occurs both in paralysis agitans and as a sequel, sometimes a very late sequel of encephalitis; 2. The uncontrollability of muscles seen in the ailment called athetosis, which frequently is due to injury of the brain at birth.

A brain operation so successful that it enabled five patients suffering from this last condition to seek employment was reported by Dr. Tracy J. Putnam, of Boston City Hospital and Harvard Medical School, at the meeting of the New Hampshire Medical Society in Boston. Dr. Putnam made an incision in the spinal cord severing one of the motor tracts in these five patients and in 33 other patients suffering from the same distressing condition of lack of muscle control. There has been a mortality of less than 4% in recent cases, and the survivors are well pleased with the result of the operation, even though for some of them the advance consisted of no more than being able to lie quietly in bed or sit up in a chair which was impossible before the operation. The improvement, even if not complete, is permanent.

Treatment of this condition by various drugs has been unsuccessful. Most of these patients had already gone through a slow and tedious process of muscle education and training with little benefit.

Drugs such as hyoscin and some of the new sleeping medicines of the barbiturate group have helped patients with tremors or palsy, Dr. Putnam reports. Cutting the motor tract on one side of the spinal cord or excising its point of origin in the brain helped six out of seven of Dr. Putnam's patients.

Science News Letter, September 23, 1939

A new waterproof finish for cloth is applied in the factory and lasts as long as the goods does.

CHEMISTRY

Mystery Fuel Tank Explosions Blamed on Bacterial Action

Chemists Hear Informally of Discovery of New Species Which Can Live on Kerosene and Ferment It Into Ethane

OUT of England's mystery of exploding gasoline storage tanks, which Scotland Yard first thought was the work of recent Irish terrorists, has come the amazing discovery of a species of bacteria which can live on kerosene and ferment it into ethane and methane fuel gases, just as ordinary bacteria can ferment sugar into alcohol.

At the meeting of the American Chemical Society in Boston, the new discovery has chemists shaking their heads and speculating on this new-found way to let nature create for them these hydrocarbon gases which can be the starting point of a host of synthetic chemical compounds.

The new kerosene-fermenting organisms were first described informally, and totally unreported, at the meeting of the International Congress for Microbiology in New York. The eminent British bacteriologist, Dr. A. C. Thaysen of Great Britain's National Scientific Laboratory at Teddington, who is now on the high seas hurrying back for military service, described the new discovery.

His story, as related by chemists who talked with him in New York, runs like this:

Scotland Yard for months has been puzzled by mysterious explosions in gasoline storage tanks holding their wartime precious fuel. Sabotage was suspected but unproved, for the terrific explosions brought complete catastrophe. Dr. Thaysen, as the government's expert on the generation of gases by bacteria, was also called in but could find no answer.

Finally, and fortunately, a kerosene tank blew up. A quick examination after the explosion showed bubbles of gas rising from the layer of water at the tank's bottom on which the kerosene had been floating.

Taking some of the water and sediment to his laboratory, Dr. Thaysen discovered his new kind of bacteria which can live in kerosene and ferment it into 10% ethane and 90% methane. He cultured this organism and then sub-cultured it and obtained a pure strain of bacteria that would grow and propagate. It was the explosive methane and ethane gas generated by these bacteria which caused the explosions. While he has not yet solved the gasoline explosions he is virtually certain that a similar action occurs there too.

Chemists here who understand bacterial fermentation see no reason why the discovery is not true, for they know of organisms which will live in strange places and which can ferment phenols like carbolic acid, and also benzoic acid.

Dr. Thaysen is well known in his field as a careful investigator. While the new discovery must, of course, be substantiated by other workers, the chemists are giving credence to Dr. Thaysen's amazing report.

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New Chemical Compounds

BY studying a way to produce artificially the red coloring matter of the blood, hemin, chemists have discovered a wholly new class of chemical compounds of surprisingly simple construction, having only 12 atoms to its essential nucleus.

Prof. Alsoph H. Corwin and Rudolph C. Ellingson of the Johns Hopkins University told the meeting that they had found the new class of chemicals in their synthetic hemin production because they noticed, on occasions, that they obtained yellow colors instead of the red ones.

Solutions containing these yellow colors had the characteristic of showing greenish-blue fluorescent hues that made them look like lubricating oils.

In the chemical detective work of learning the structure of this new kind of chemical molecule, Prof. Corwin and Mr. Ellingson found that a molecule of ethyl, or grain, alcohol had disappeared in the chemical reactions leading to its formation. Thus they set about systematically inserting, at known spots in the molecule, a piece of methyl alcohol. This served as a "tag" to mark the key points of the new molecular structure that formed the new yellow compound.

A molecule of only twelve atoms is relatively simple in organic chemistry where the number of artificial chemical compounds now approaches nearly a million, Prof. Corwin said. But a search of chemical literature failed to show a previous discovery of the new kind of yellow molecule.

"Very little is known about the properties of the new compounds as yet," Prof. Corwin said. "They may be poisonous or not, helpful or harmful. The only thing known with certainty is that various members of this group are capable of making practically any liquid look as if it were lubricating oil because of the greenish-blue hue they give off as fluorescence."

Science News Letter, September 23, 1939

Research Can Prevent War

SCIENTIFIC research can eliminate the economic causes of war, Dr. Karl T. Compton, president of Massachusetts Institute of Technology, noted scientist and a member of the newly-created National War Resources Board, told the dinner meeting of the American Chemical Society.

"Science can never overcome the desire which some men have for domination," President Compton declared. "It cannot remove ambition and envy from the human breast. But insofar as wars may be induced by economic considerations, science may do much to remove the causes."

Outside of sheer domination wars come because one nation wants the economic resources held by another. Great Britain wants oil and food which the British Isles cannot produce. Germany and Japan want rubber, foodstuffs and mineral resources. It is from these and similar wants that modern wars spring, Dr. Compton said.

The necessities for these economic needs of nations can be taken care of by scientific research, Dr. Compton continued. Synthetic substitutes can be created at a cost far less than a major war and within a time far less than that in which the effects of a major war can be recovered from, he said. "At the same time this could be done not only without hurting anyone but with great indirect benefit to all concerned."

As examples of substitutes already known, Dr. Compton gave:

1. Synthetic gasoline from coal. Coal sources are much more abundantly distributed throughout the earth than are petroleum fields. (*Turn to page 205*)

PHYSIOLOGY

Ragweed Grows in Japan, But Doesn't Cause Sneezes

LOW ragweed, one of the most evil of American hay-fever plants, is abundant in Japan but apparently causes no sneezes, Saburo Katsura, Japanese scientist at present in this country, informs Science Service. Mr. Katsura is a graduate student at the University of Maryland and also is a temporary scientific aide in the U. S. Department of Agriculture.

Although ragweed has been in Japan for many years, nobody has ever paid much attention to it because it has caused little trouble, Mr. Katsura states. Learning of its ill repute in America, he sent home for some of its flowers and had the pollen tested by an American pollen specialist, Dr. R. P. Wodehouse of Yonkers, N. Y. Dr. Wodehouse reports that the pollen produced typical reaction in sensitive persons.

Mr. Katsura states that Japan is a land of no hay-fever. He has known only one Japanese hay-fever victim, a woman scientist who became sensitized to poplar pollen during a sojourn in England. After her return to Japan she continued to have attacks every spring, but when a poplar tree that grew in her neighborhood was cut down the attacks ceased. Mr. Katsura has been in correspondence with Japanese physicians, who confirm his statement, and who add that foreigners in Japan are also free of hay-fever.

Nobody knows when the American ragweed invaded Japan. Its presence was first mentioned in print about 45 years ago, so that it probably sneaked in as a stowaway on one of the first American ships to visit Japanese ports after commercial relations between the two countries were opened up.

Science News Letter, September 23, 1939

ETHNOLOGY

"Grandmother" of Natives Tells Amazing Life Story

ONE OF the amazing adventures in anthropological science is the 35-year stay of Daisy Bates, Irish woman, among her "grandchildren," the Australian natives.

Imagine Mrs. Bates, a news correspondent in London in the gay nineties. An assignment came to investigate reports of white settlers' cruelty to Australian aborigines. She sailed to get her story, and later remained to bury herself, most people would think, among the pathetic, bewildered blacks who needed her.

Now, 78 years old, Daisy Bates tells her all but incredible experiences in a vigorous book, "Passing of the Aborigines."

Her idea in Australia was to treat the sick, provide food and other necessities for the aged and children, help the natives meet the baffling invasion of civilization. It was a grandmotherly role, and the natives accepted her as Kabbarli, or grandmother.

To understand them, she went to lengths that few anthropologists have rivaled. She reasoned that she must think with a "black man's mind" and talk his language. Notebook in hand, she began by compiling a dictionary of words and sentences used in the Broome district and she ended by speaking 188 dialects.

She roved among the tribes, a dignified figure with a protecting veil on her hat and gloves on her hands. The gloves often aroused private and press comment. But they were her safeguard against infection as she bathed septic sores and treated repulsive ills. Once she forgot her gloves, and got an infected finger that took six months to heal. She never has approved of hospital beds for natives.

A character for legends is Daisy Bates: She quelled a native uprising by clever debate and a tea party. She guided rival tribes through a peaceful exhibition of tribal life, using a red umbrella as a signal.

She acted as government attaché with an anthropological expedition led by Prof. Radcliffe-Brown, served as justice of the peace for two Australian states. In 1933, the late King George V created her a Commander of the Order of the British Empire. That she considers a "full reward."

Science News Letter, September 23, 1939

BOTANY

Chromosomes Are Doubled By Fungicide Treatment

CHROMOSOMES in growing grain have their numbers doubled when the seed is treated with a fungicide distributed under the trade name "Granosan," Dr. Dontcho Kostoff of the Institute of Genetics in Moscow has discovered.

Seeds treated with the compound are not attacked by fungi, whereas seeds treated with colchicine are frequently killed by these parasitic forms, Dr. Kostoff points out.

Science News Letter, September 23, 1939

IN SCIEN

GENERAL SCIENCE

Birthday of Columbus Used To Remind U. S. of Liberty

THE BIRTHDAY of Christopher Columbus will be used to help Americans rediscover America. A group of scientists and professors organized as the American Committee for Democracy and Intellectual Freedom after striking reaffirmations of intellectual liberty on last Lincoln's Birthday have proclaimed the week of Oct. 8 as "American Rediscovery Week."

Cruel, inhumane, intellect-fettering events abroad and intolerance at home cause stirring opposition to "attempts to deny man's right to express his opinions freely and to share in the choice of his government," "dissemination of false racial theories that set man against man according to the color of his skin or the name of his grandfather," and "attempts to deny the foreign born and aliens the equal protection of laws which the Constitution guarantees them."

Science News Letter, September 23, 1939

CHEMISTRY

New Kind of Vitamin Is a Pyridine Derivative

EVIDENCE of the possible existence of another kind of vitamin B, the eleventh food factor to be carved out of the original vitamin B by chemical and biological research, has been discovered by Prof. Paul Gyorgy and Robert E. Eckardt of the Western Reserve University School of Medicine.

Working with rats, they found that there are skin lesions that persist even though the rats are fed a diet containing the known necessary vitamins, including purified natural or synthetic vitamin B_6. Their conclusion (*Nature*) is that "the role played by the vitamin B_2 complex in dermatologic conditions has to be extended beyond B_6."

The new factor has not yet been named, but it is suggested that vitamin B_6 should be called pyridoxin, because it is a pyridine derivative containing several methoxy groups, and not adermin, referring to its dermatologic protection, now shown to be not complete.

Science News Letter, September 23, 1939

NCE FIELDS

MILITARY SCIENCE

German Fortifications Have Had Three Names

SIEGFRIED Line, alias Limes Line, alias Westwall — that formidable German array of pillboxes and tank-traps has changed names twice.

Siegfried Line has romantic Wagnerian appeal. But there was a Siegfried Line that caved in, back in 1918.

Limes Line seems to have been derived from old Limes Germanicus built by Romans against German barbarians.

Westwall is strictly descriptive and noncommittal. It is pronounced "vest-vall," if you really want to approximate the German way of saying it.

Science News Letter, September 23, 1939

MEDICINE

Present New Challenge In Fight on Cancer

CANCER of the stomach kills between 40,000 and 50,000 persons in the United States each year, being responsible for about one-third of all cancer deaths. But many of these lives, perhaps 10,000 a year, could be saved.

This challenge to doctors and laymen appears in a new book, End Results in the Treatment of Gastric Cancer by Drs. Edward M. Livingston and George T. Pack (Hoeber). The book is technical, designed primarily for doctors, but many of the 65 conclusions are important for everyone to know.

"Cancer of the stomach is curable," the authors state. The only way to cure the condition at present is by a surgical operation. The chief point about stomach cancer is to determine, Drs. Livingston and Pack declare, whether or not the patient has a cancer which can be removed successfully.

From two-thirds to three-fourths of the patients with stomach cancers have cancers which cannot be removed by surgery at the time they are first seen. But this does not mean hope should be abandoned when stomach cancer is first suspected. Even at the time of death about one-fourth of those who died of stomach cancers were found at post mortem examinations to have tumors of the kind that could have been removed.

About one-third of those who survive the operation are alive at the end of three years. One-fourth are living at five years, and one-fifth live more than 10 years from the time of discharge from the hospital. Many hundreds of persons lived and were well from 10 to 20 years following the operation. The figures are even more impressive when you consider that the average age at which the disease occurs is 61.2 years, an age at which about two-thirds of the patients would normally live only 10 years longer.

The layman can meet the challenge by getting medical attention promptly if he has any symptom that might mean stomach cancer—persistent indigestion, for example. Physicians can meet the challenge by seeing that the stomach cancer patient gets the operation that is his only chance of cure at present.

Science News Letter, September 23, 1939

HISTORY

Trace De Soto's Route To Mississippi River

THE WANDERING route that Hernando de Soto took to seek a fabled El Dorado and to find the great Mississippi River has been traced in 20 years of scientific investigation, in time for the celebration of the four hundredth anniversary of the historic expedition, in 1940 to 1943.

Few details regarding De Soto's journey through wilderness and swamp in Indian country from Florida to the Mississippi are any longer in doubt, is the verdict of Dr. John R. Swanton, Smithsonian Institution ethnologist and chairman of the U. S. De Soto Expedition Commission. Working with other members of the fact-finding commission, Miss Caroline Dorman of Chestnut, La., and Col. John R. Fordyce, of Little Rock, Ark., recently deceased, Dr. Swanton has identified places of the route in spite of tremendous changes in the countryside. Dr. Swanton's knowledge of Indian languages and customs proved an invaluable asset in the detective task of following the trail, 400 years cold.

The commission's report, just issued by Congress as an official document, will be used in arranging ceremonies and other recognition of the long exploration journey in the course of the next four years. A commemorative De Soto stamp and a memorial at the place where the Mississippi was first sighted will be considered at the next session of Congress.

Science News Letter, September 23, 1939

OCEANOGRAPHY

War Hazards Added To Icebergs and Derelicts

ADD to icebergs, half-sunken derelicts, uncharted reefs, rocks and shoals —War. The Hydrographic Office of the U. S. Navy, which regularly sends out warnings on navigational obstructions to U. S. shipping, has added the notice regarding the mining of the waters around Danzig, and states that further notices of war dangers will be added as the situation develops.

Science News Letter, September 23, 1939

CHEMISTRY—AGRICULTURE

Chemical Spray Makes Apples Look Redder

APPLES coming to market in future will have their cheeks reddened by a new chemical spray, discovered by Drs. R. B. Dustman and I. J. Duncan of the West Virginia Agricultural Experiment Station. It will be a natural glow, too—not a make-up job.

Natural red color of apples is due to a pigment known as idaein, earlier researches had shown. The two chemists at the experiment station undertook to find some chemical that would stimulate the formation of this pigment, and discovered it in several compounds involving the thiocyanate ion. These not only intensified the color of naturally red apples, but could induce a slight blush on yellow apples, like Grimes Golden, that normally have little or no red coloring.

Large-scale orchard spraying tests have now been made for four consecutive years, so that Drs. Dustman and Duncan state that they feel justified in announcing their results. (*Science*, Sept 8)

Science News Letter, September 23, 1939

ANTHROPOLOGY

Man May Have Developed From Several Centers

NOT just one birthplace for mankind, but several; that is the latest idea about the origin of the human species expressed by Dr. Franz Weidenreich, of Peiping Union Medical College, famed as discoverer of Peking man. Says Dr. Weidenreich: "One single center where all of mankind originated never existed. Man must have developed from different centers distributed over the world, each branch taking its own course more or less independently of the others. The result of this trend is manifested by the existence of the various races today."

Science News Letter, September 23, 1939

MILITARY SCIENCE

U. S. Prepares

America Wants to Avoid War, But is Carefully Arming With Rifles, Field Guns, Howitzers, and Machine Guns

By DR. FRANK THONE

See Front Cover

UNCLE SAM is watching the deadly game on the other side of the Atlantic with no more wish or intention of dealing a hand for himself than he had in 1914. No sensible person would ever want to sit in on a game like that, where the stakes are the whole manhood and wealth of nations and the only possible prizes are death and destruction.

Yet, remembering how he was drawn against his will into the first World War and how he had to improvise his weapons in a great and wasteful hurry, Uncle Sam is wisely taking stock of what he has ready for service now, or can produce quickly, if circumstances not now foreseen compel him again to face a foe in arms.

Item number one, in any man's army inventory, is always the infantry rifle. Despite a couple of decades of talk about the man on foot being eliminated in the "next war," by rattling tanks on the ground and roaring airplanes in the air, the doughboy with his individual weapon has shown unexpected powers of survival and resistance. Infantry still remains the final argument in battle.

And in the new Garand semi-automatic rifle, your old Uncle holds a trump card that tops anything in the hands of any nation on earth. It fires the standard .30-caliber cartridge as fast as the soldier can pull the trigger, increasing his rate of fire at least fourfold. Furthermore, despite this almost machine-gun-like rapidity of fire, accuracy is also tremendously increased, because the soldier does not need to take the weapon away from his shoulder and operate the bolt mechanism by hand. The loading mechanism is operated by a part of the energy of the firing itself.

Good Against Aircraft

It is considered probable that the Garand is capable even of anti-aircraft fire, against low-flying planes that suddenly appear to bomb and machine-gun marching columns. A hundred men, each firing his clip of eight cartridges in perhaps half as many seconds, should be able to make a "strafing" flier think he had stumbled into a nest of steel hornets.

Arming of the Regular Army and the National Guard with the Garand is now proceeding apace, and quantity production can be stepped up if the need comes.

Next to the infantryman's rifle, the most important army weapon is the light field gun, the quick-firing, fast-moving piece of artillery that can lay down a barrage of 30 or more shells a minute, and move about at least as rapidly as the infantry which it supports.

No better gun for this purpose has ever been built than the famous French 75, of war-time fame. Although a little more than 40 years old in its design, it is still going strong; and there are some thousands of them in reserve in U. S. arsenals. The exact number is an official secret, but it is admitted that there are enough of them "to equip a good-sized army."

New Gun Carriage

The weakness of the war-time 75 is its carriage, not built for modern motor-towing speeds. However, Army ordnance designers have worked out a new all-steel carriage with rubber-tired disk wheels, that will permit it to go anywhere at any speed. It also permits a much greater elevation, that increases its maximum range from 8,000 to 13,500 yards. This will permit longer firing from a given position before it is necessary to limber up and follow the advancing infantry—a highly important matter when an attack is being developed.

Around these two prime weapons are grouped many others—the heavier artillery pieces, ranging all the way up to the massive 16-inch guns mounted on railway carriages; three-inch and four-inch semi-automatic anti-aircraft cannon; new 37-mm. anti-tank guns that hurl a one-pound armor-piercing shell like a small bolt of lightning; improved trench mortars that lob heavier shells more accurately than their ancestors of 1918; even the old reliable hand grenade, little changed from its original pattern.

Most of these, with the exception of the heavier artillery pieces, have become infantry weapons. The old-time picture of the foot-soldier, armed solely with rifle and bayonet, has been greatly changed since 1918. A modern infantry column on the march does not present the picture of even, serried ranks with sloping bayonets agleam like the even blades of grass in a field. It is more likely to look like a somewhat tidied-up Gypsy caravan, for it includes light and heavy machine guns, automatic rifles, light mortars or howitzers, anti-tank cannon, trench mortars, and light tanks.

All these are necessary on or near the front line in both attack and defense. The handiness of the 45-mm. howitzer was especially well demonstrated in the Spanish Civil War. Keeping close behind the advancing infantry, it could go into action quickly, to blast out stubborn machine gun nests with its light shells.

No less necessary are anti-tank weapons. Even the flexible 75 is not nimble enough to catch these monsters on the

DEADLY

Here is the new, famous semi-automatic Garand rifle which shoots bullets as fast as a soldier can press the trigger and turns infantrymen into virtual machine gunners. Invented in the U. S. this semi-automatic type gun will undoubtedly play a leading role in warfare for it outshoots bolt action rifles four to one and makes possible more accurate fire. This gun is also shown on the front cover of this week's SCIENCE NEWS LETTER. The soldiers in that photograph are demonstrating that they can operate the rifle while protected with gas masks.

PREFERRED

Still the best for general use in wartime is the French type 75 which, although 40 years old in design, has been modernized by a split trail, above, which enables a greater range of fire.

crawl, and its shell is unnecessarily heavy, anyway. Better is the high-velocity one-pound missile of the long-barreled 37-mm. piece designed especially for the job, which goes right up with the troops and can see the lumbering enemy approaching.

Of dual usefulness is the .50-caliber machine gun, which hurls a stream of heavy slugs half an inch in diameter. It can be cocked back at high angle, to defend the front line against approaching airplanes, and it can be brought down to the horizontal again, to hammer away at approaching tanks. With armor-piercing bullets the .50-caliber machine gun is effective against light tanks at close and medium ranges.

Every soldier, of course, will carry his gas mask at the alert, as he learned to do during the first World War. The new American gas masks are both more efficient in excluding gas and more comfortable to wear than were the rather crude masks of those days. Then, a company or a battery was "neutralized"—virtually out of action for the time being—as soon as it had to put on its gas masks. Soldiers wearing masks can now breathe so comfortably and see so well that they are able to go right on firing. There are special masks with optically perfect eye pieces for artillery officers who must read and set delicate scale markings for proper range. And such officers' masks frequently are of the diaphragm type with a special mouthpiece so that commands can get out but poison gas cannot get in. Such masks are also of extreme value for the men of the signal corps who act as telephone operators at the front in wartime.

Gas mask canisters, holding the chemicals which neutralize the deadly effect of the poison gases, are more compact than ever before. Yet they hold chemicals that will combat more different gases and they have a longer "life" before need comes for replacement.

All around, then, Uncle Sam can look over the situation, if not with smug self-satisfaction, then at least with the knowledge that he is ever so much better off than he was in 1917, and knows what he needs to do to meet deficiencies that still exist.

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PSYCHOLOGY

Teachers' Marks Do Not Match Child's Achievement

ABOUT 33,000,000 children in the United States are now working for the first "marks" of the new school year.

Parents may have offered bribes or threatened punishments. Teachers may have encouraged the spirit of competition in an earnest effort to make those marks shining ones.

The two million puzzled first-graders who have never been marked before and do not know that they will never be marked after school life is over may be wondering just why those symbols on the report card should be considered so extremely important.

Psychologists and educators are beginning to wonder, too. The school mark is so ancient an educational device that its origin is lost in the mists of antiquity. We can only guess who was the inventor of such a troublesome system.

That both teachers and parents should cease placing a high value upon it is indicated by recent research by Dr. Clarence Carl Moore, of the Colorado State College of Education.

"There is not," said Dr. Moore in a report to the *Journal of Genetic Psychology*, "a high degree of relationship between the marks that teachers assign their pupils at the end of a semester and the standing of pupils on either standardized tests of achievement or intelligence."

This conclusion was based on studies of the fifth and sixth grades in Glenrock, Wyoming, Branson, Colorado and Grover, Colorado.

The closest correlation between teachers' marks and actual achievement was in mathematics. Reading was next, language and literature third and social science fourth.

Dr. Moore urges that educators work out some new schemes for measuring the progress of their pupils and the efficacy of their educational methods.

Standardized tests of achievement should receive more study. "Some," he said, "are limited to a general survey of pupil achievement while others sample more definitely specific interests.

"However, most standardized tests of achievement do not sample adequately the fields of the pupils' specific interests to give an adequate picture of the whole child."

Science News Letter, September 23, 1939

METALLURGY

Russian Iron Deposit Will Yield Ore in 1940

AN EXTREMELY rich and large deposit of iron ore which contains about half of the total world iron resources will begin in 1940 to yield ore at the rate of 300,000 tons a year.

It is known as the Kursk magnetic anomaly because of the immense effect that it has on the magnetic needle.

The Kursk ore carries up to 67% iron content and the ore layers average 200 feet thick.

Science News Letter, September 23, 1939

PSYCHIATRY

Commonest Insanity Linked To Body's Hormone Trouble

Statistical Study Reveals Symptoms of Schizophrenia Strongly Resemble Those of Thyroid Deficiency

POSSIBILITY that the most common of mental diseases, schizophrenia, is associated with inability of the body to use the secretion of the thyroid gland is suggested by a study of 129 patients just reported by Dr. Joseph C. Rheingold, of the University of Illinois College of Medicine. This inability may, in turn, be due to failure in functioning of the hypothalamus, a part of the brain.

So closely are the symptoms of schizophrenia, as revealed by this statistical study, like those of patients with thyroid deficiency that reading the description of the physical signs of the first is like reading a description of the other, Dr. Rheingold said in reporting his findings. (*Psychosomatic Medicine*).

Most noteworthy is a tendency to low oxygen consumption. Low blood pressure, slightly elevated blood cholesterol content, low normal carbon-dioxide combining power, and secondary anemia all point to a state of general lowered metabolism which is characteristic also of the sufferer from insufficiency of thyroid secretion.

This tie between schizophrenia and hypothyroidism may not be true of all cases, Dr. Rheingold warns, and it may not be responsible for the origin of the mental difficulties of the schizophrenic patient.

"But the suggestion is offered," he said, "that no matter whether the metabolic and the mental characters arise simultaneously or in sequence, the hypothyroid state once established is capable of perpetuating the signs referable to the brain."

Scientists have already found that integrated brain function depends upon the brain's receiving an adequate supply of oxygen. Reduced oxygen tension of the atmosphere such as experienced by flyers at high altitudes or those suffering from mountain sickness produces disorders of behavior resembling those seen in schizophrenic patients.

In addition to this direct effect upon the brain, hypothyroidism would also exert secondary effects through disturbances of water and calcium metabolism which act as a further damper on brain activity.

But the schizophrenic's symptoms are apparently not due to actual lack of thyroid substance, since feeding of thyroid gland does not cure the disease.

From evidence in the literature provided by study of the brains of schizophrenic patients who have died and the effects of certain drugs, Dr. Rheingold has suggested that it is possible that the difficulty is a failure of the hypothalamus—a part of the brain that appears to control the body's use of the thyroid secretion. Such failure would account not only for the hypothyroid symptoms but for the inefficacy of thyroid feeding.

This report is the first of a series dealing with the integration of bodily mechanisms in schizophrenia. The ultimate aim is to provide the basis for a rational therapy of this common and little understood mental disease.

Science News Letter, September 23, 1939

PSYCHOLOGY

Work Is Chief of Factors Making Up Successful Life

WORK, love, philosophy and recreation—on these four fundamental cornerstones you can build for yourself a worthwhile life. The recipe is given by Dr. George Ross Wells, psychologist of the Hartford Seminary Foundation, in a new book *The Art of Being a Person* (Appleton-Century).

Work is necessary for more than its opportunities for creative endeavor. To be paid for your work, to earn a living, is proof positive of your value to your fellow men. And this reassurance is essential to that feeling of self-respect and self-confidence that is man's chief need.

It is pleasant to be praised; it is sometimes very difficult to endure criticism; but the appearance of a paycheck at the end of the week or month is immensely more important than either as convincing evidence of the individual's worth in the world of human affairs.

"If work," said Dr. Wells, "proves our value to society and therefore to ourselves, love proves our value to an individual, and, again, therefore, to ourselves. Love is an irreplaceable cornerstone of the serene life.

Although the major satisfaction of love is in the loving, it does make a difference upon what object we shower our affections. It is pathetic when love is centered upon an inanimate object or an animal incapable of returning the affection. It is also unfortunate, Dr. Wells declares, when men come to love ideas or institutions instead of individuals.

The philosophy or religion of the individual should dignify the individual and accord to him real worth and an essential although proportionately small place in the eternal scheme of things. No one can attain serenity who regards himself as completely worthless.

Finally, recreation plays an important part in building the personality.

"The arts," said Dr. Wells, "are for many persons the most effective as well as the most enjoyable of recreations. Music is for very many people the supreme compensation for the problems and sorrows of life, making contribution of tremendous value but without excessive fatigue or any type of destructive influence."

Science News Letter, September 23, 1939

MEDICINE

Cancer-Causing Substance Found in Irradiated Fat

NEW LIGHT on the cancer problem is coming from chemical search for cancer-causing substances in fats carried out by Dr. H. Veldstra at the Laboratory of the Anthony van Leeuwenhoek House in Amsterdam. One such substance, Dr. Veldstra reports (*Nature*), may explain skin cancer found in the tropics, also the high percentage of cancer of the stomach in northern regions. Skin cancer in the tropics, according to one theory, is caused by cancer-producing substances formed in the skin under the action of the sun's rays. Cancer of the stomach is ascribed by some investigators to the diet and its preparation, specifically to the heating of fats. Irradiation of the skin may change its fatty cholesterol into a cancer-producing chemical. Heating fat in cooking may produce the same cancer-causing chemical. Dr. Veldstra reports significantly that irradiation of a fatty substance akin to skin's cholesterol does produce a cancer-causing chemical. Further investigations, now under way, may fit the pieces of this puzzle together and may bring scientists nearer to a solution of the cancer problem.

Science News Letter, September 23, 1939

PUBLIC HEALTH

Pneumonia Death Rate Cut By Use of Sulfapyridine

Report From Norway Shows Reduction of Fatalities Of Three Fourths or More; "Nonallergic" Label Banned

THE PNEUMONIA death rate in Norway has been cut three-fourths or more by the use of the new chemical remedy sulfapyridine, the Oslo correspondent of the American Medical Association reports. (*A.M.A. Journal,* Sept. 2). Serum treatment of pneumonia was never very popular in Norway, chiefly because of the frequently great distances between the patient and a laboratory where typing of the pneumonia germs could be done. This disadvantage does not hold for sulfapyridine, which is apparently being widely used. Records from various hospitals show that among 342 uncomplicated cases treated with this new drug, there were only 20 deaths, giving a death rate of 5.8 per cent contrasted with a rate of from 20.5 to 35.2 per cent in the pre-sulfapyridine period of 1928-1938.

Science News Letter, September 23, 1939

Combat Tropical Diseases

SULFAPYRIDINE, sulfanilamide and other members of this powerful disease-fighting family of chemicals are winning fresh triumphs against diseases that threaten life and health in the tropics, according to reports of discussions at the Royal Society of Tropical Medicine and Hygiene in London. Most impressive, perhaps, are the experiments showing "remarkable results with sulfapyridine for plague, although little has been published about the drug's action on bubonic plague in man. Elephantoid fever and some strains of malaria may also be controlled by the chemical remedies.

Science News Letter, September 23, 1939

Whitens Negro Skin

LOSS of coloring matter from the skin of Negro and white workers in a leather manufacturing company was traced, by Drs. Edward A. Oliver, of Chicago, and Louis Schwartz and Leon H. Warren of the U. S. Public Health Service, to an ingredient in a certain brand of rubber gloves worn by the workers. The ingredient is an antioxidant known by the trade name of Agerite Alba, the doctors reported to the A. M. A. Workers in other tanneries, plating works, electrical apparatus manufactories and all other places where that particular brand of rubber gloves was worn were found to be having the same skin trouble. The rubber company has withdrawn the antioxidant from the rubber glove formula and the workers are all gradually getting the color back in their skin since they have stopped wearing gloves containing this ingredient.

Science News Letter, September 23, 1939

"Nonallergic" Label Banned

MUSCLE oil, contour cream, skin food, rejuvenating cream, hair color restorer and hair grower are among the terms formerly seen on labels of cosmetics which are now banned by the new laws governing foods, drugs and cosmetics. Commenting on the list of banned terms recently issued to manufacturers by the federal authorities, the editor of the American Medical Association calls special attention to the term "nonallergic" now also banned by federal law. The term is considered misleading because while cosmetic products may be and are made without such ingredients as orris, to which many persons are allergic, even the simplest preparation may be allergenic to susceptible persons. The problem of allergy was one of the first attacked by an A. M. A. committee appointed, before the new federal laws were passed, to advise the Journal of the A. M. A. concerning cosmetic products advertised in its pages.

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President James Madison over 100 years ago predicted that by 1930 the United States would probably have 192,000,000 people.

An apparatus for de-insectizing airplanes has been devised by a South African health official, who sees grave danger of airplanes spreading yellow fever throughout Africa.

●RADIO

O. C. Durham, chief botanist at the Abbott Laboratories, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, October 2, 4:30 p.m., EST, 3:30 CST, 2:30 MST, 1:30 PST. Listen in on your local station. Listen in each Monday.

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2. Synthetic rubber can be made for automobile tires and the countless other uses of rubber out of raw materials such as air, coal, limestone and water that are widely distributed.

3. "Chemical agriculture" growing an abundance of food in tanks and other compact places can overcome the fear of nations about their food supplies.

4. The development of lacquers for the interior linings of food containers has overcome the fears of the U. S. about a stoppage of Bolivian tin supplies.

"A good deal has been said about the ways in which science has been applied to make warfare more destructive, just as science has also been applied to bring about a certain compensating degree of protection against new weapons. . . . Far more significant than these is the use of science to remove some of the major causes of war," Dr. Compton declared.

Science News Letter, September 23, 1939

"Chemical Dice Game"

A "GAMBLING" type of chemical reaction, new to science, promising important developments in America's $200,000,000 organic chemical industry, was announced at the meeting. It may explain even the aging of wines and liquors.

The new reaction, revolutionary in its fundamental concepts, obeys the laws of

chance by which mathematicians can determine the odds in games like dice, poker and bridge.

One might call the new reaction a "chemical dice game," said Dr. George Calingaert, director of chemical research of the Ethyl Gasoline Corporation, who described the new discovery. It takes place between chemicals ordinarily considered inert to one another and without chemical affinity which is usually thought to produce chemical activity.

So new is the discovery that its potentialities are as yet unrealized, but they are believed to be very important.

By what is called the "redistribution reaction," chemical compounds are found to redistribute themselves into a number of compounds in the presence of a proper catalyst. It is possible to predict by the mathematical laws of chance, or probability, just what the end distribution of these new compounds will be.

The new reaction may help to explain the reactions which occur during the aging of wine or liquors. These subtle changes do occur, for man's taste is able to detect the differences. But chemical tests are worthless to measure the changes. Why they occur is still more of a puzzle.

"It may well be that this aging is in fact a 'natural redistribution' among the esters which are known to constitute the flavoring portions of these liquids," Dr. Calingaert said. "If such should prove to be the case, it seems likely that a better understanding of the nature of the aging process will soon lead to improvement in the technique of accomplishing this all important result.

"Simple catalysts were used throughout the experiments. These catalysts weaken intramolecular attractive forces commonly considered to be quite firm. The groups of atoms, which break loose from the molecules, interchange purely at random with other similar groups. After these random interchanges have taken place long enough, a state of 'mathematical equilibrium' is reached in which the composition of the reacting mixture exactly equals that which can be predicted by the laws of chance."

Dr. Calingaert's initial experiments were carried out in research on the nature of tetraethyl lead and related "antiknock" compounds for gasolines.

It is already known, however, that the new type of chemical reaction takes place between compounds which chemists say are inert to one another, such as gasoline and kerosene, or milk and cream. All customary signs of chemical reaction are absent. There is no formation of a solid precipitate, or a gas, or even the heat so common to many chemical reactions.

Science News Letter, September 23, 1939

Coldest Refrigerator

THE world's coldest refrigerator, operating at 450 degrees below zero Fahrenheit, is in prospect as the result of discoveries reported by Prof. S. C. Collins of Massachusetts Institute of Technology.

The new type refrigerator would operate on compressed helium, the light inert gas used to inflate airships. When liquefied, helium produces the coldest cold known to man, only a few degrees above absolute zero.

"One does not ordinarily think of a steam or a compressed-air engine as being a refrigerating machine," Prof. Collins reported.

"Yet the well known principle on which they operate consists of the withdrawal of heat from the working gas and its conversion into work. Any gas expanding against a working piston is cooled by expansion. For instance, the temperature of a sample of air originally at 70 degrees Fahrenheit will fall more than 100 degrees if allowed to double its volume in an engine cylinder."

Major trouble to be overcome in a compressed helium engine, Prof. Collins indicated, is the matter of lubrication, for at 450 degrees below zero Fahrenheit all lubricants now known are frozen solid.

Prof. Collins solved this difficulty by doing away with lubricants and replacing the conventional piston of an engine with a flexible diaphragm of stainless steel. This diaphragm is sealed at its edges by a copper gasket between two steel plates. The expansion of the helium occurs between the diaphragm and one of the plates.

Two or even three such engines will be used in consecutive stages in refrigeration, for it is not practical to try to reach the extreme low temperatures in one single jump down the temperature scale.

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Sell Heavy Carbon Atoms

MASS production of heavy carbon, the isotope of the ordinary kind of carbon that is a basis of all living matter, was announced at the meeting by the Nobel Prize chemist of Columbia University, Prof. Harold C. Urey, who won the world's outstanding scientific award for his discovery of heavy water.

By the chemical method of separating the heavy kind of carbon of mass 13, from ordinary carbon of mass 12, Prof. Urey is now able to supply the needs of scientific workers all over the world with this valuable stable kind of carbon whose atoms can be used as tags to aid chemists in labelling parts of their atoms.

By adding atomic tags at the proper places scientists can carry out intricate reactions and then detect, in their results, the movement, within the molecule, of the atomic tags.

With the successful production of quantities of carbon of mass 13 (which, incidentally, you can buy at $400 an ounce) the elements hydrogen, carbon, oxygen and nitrogen are now available in their stable isotopic form for use as tags in research. These four elements are found in over 90% of all chemical compounds known, and are especially important in all biological problems.

The other way to produce tags on atoms to trace out chemical behavior is to bombard them in atom smashing machines and render them radioactive. This radioactivity, or spontaneous disintegration, can then be detected with the proper instruments.

To a member of the Science Service staff, Prof. Urey explained: "Much interest has been exhibited in recent years in artificially radioactive substances in solving important biological problems. But it really seems to me, at the present time, that most of these problems can be

solved best by the use of the stable isotopes of the overwhelmingly important elements, hydrogen, carbon, oxygen and nitrogen which can only be supplied in quantity by the chemical method of the separation of isotopes.

"Fortunately it appears that the stable and radioactive isotopes complement each other in scientific investigation. The chemical method of separation of isotopes works best with the all-important elements, hydrogen, carbon, nitrogen and oxygen. The method of thermal diffusion and the artificially radioactive method of tagging elements works very well for the remainder of the elements in the periodic table."

While atom smashing and the production of radioactive elements for biological and chemical experiments is the current trend in physical science there are a whole host of experiments which are lengthy ones, involving the feeding of experimental animals with isotopic materials. For all such experiments, many of them the most important in the realm of biology and physiology, it is essential to have stable isotopes and not radioactive ones which disintegrate quickly. The half life of radioactive carbon, the element found in all living matter, is only about 20 seconds. Experiments performed with radioactive carbon must be done quickly. Such haste, potentially, may lead to errors.

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AGRICULTURE

Europe's Good Crops Promise To Prolong War

EUROPE has good crops this year, a U. S. Department of Agriculture survey shows. The war will therefore go on that much longer before old General Starvation begins his inevitable campaign. Herr Hitler waited until the reapers had gathered in the grain before sending them out to be scythed down themselves.

Potatoes and sugar beets, top crops in both Poland and the Reich, have yet to be dug: their harvest season is September and October. After that the diggers can go to work digging for themselves—trenches, and graves.

Europe's corn crop, like America's, is of bumper proportions this year. There is at least a fair chance that it may be harvested and not tramped down by hobnailed boots—the Iowa of Europe lies in countries that are still neutral: Rumania, Yugoslavia and Hungary.

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ZOOLOGY

NATURE RAMBLINGS by Frank Thone

Tame or Domesticated?

WIDESPREAD custom regards "domesticated" and "tame" as synonyms. Yet even a moment's reflection will show how far from fact that is.

A domesticated animal is one that has been brought into common use by man, for food, clothing, work or other human purposes. It may still be able to get along all right in the wild if it escapes or is lost, like the turkey or the goat, or it may have been so changed by breeding that it would perish if restored to natural conditions, like modern high-bred hogs or sheep.

A tame animal, on the other hand, is one that is on friendly terms with man, whether it is useful to him or not. It may be intimately domesticated like the dog, or loosely domesticated like the cat, or not domesticated at all. We all know of tamed wild animals of the widest variety, from squirrels, chickadees and turtles to toads, crows and even skunks.

Some of the most traditionally domesticated animals are not tame at all. Silkworms, for example, are known only in domestication, yet no one ever thinks of them as tame animals. Bees also are domesticated insects (though carelessness may permit a swarm to escape to the wild), but they certainly are not tame. Sight of a bee-keeper, with his veil, gloves and smoker, is testimony enough on that point!

Larger domestic animals are often just about as unruly and hard to handle as bees. Travelers tell of the struggle that ensues whenever a Lapp woman wants to milk a female reindeer, or when her husband tries to harness up his sledge. The intractability of camels, and of their South American cousins, the llamas, is proverbial. Closer home we have the more familiar examples of the donkey and of his illegitimate child, the mule.

Sometimes the absence of tameness in a domestic animal seems to be the result of differences in physiology, particularly sex. Most cows, ewes and she-goats are tractable and tame enough, but who would ever be foolish enough to turn his back to a bull, ram, or billy-goat?

At certain times, however, even the tamest of female animals will turn savage, especially when they have a brood of young. Tabby, who obligingly runs up a tree for the amusement of any wandering dog, will be turned by a litter of kittens into a prowling, demon-eyed murderess, just daring any canine to venture within a city block of her lair.

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ARCHAEOLOGY

Egyptian Paintings Found In South African Cave

CAVE paintings that seem to be the work of ancient Egyptians, not primitive Bushmen, are the reported discovery of a northern Transvaal farmer, G. Gadda.

Recognizing possible importance of the paintings, which if actually Egyptian would revise ideas of South Africa's history, Mr. Gadda has arranged for Dr. Robert Broom of the Transvaal Museum to inspect the cave.

Whether or not Egyptians explored or colonized in South Africa has been frequently argued, and the finding of Egyptian art so far inland would be a valuable clue. Twelve years ago, paintings found on rocks in southern Rhodesia, not far north of the present find, were considered by some observers to be significantly like Egyptian art, but more evidence has been awaited.

According to the Greek historian Herodotus, fifth century B.C., Pharaoh Necho sent a fleet manned by Phoenicians from Egypt to sail around Africa, about 600 B.C. Until recent years, this was regarded as an unlikely story.

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PHYSICS

Old Phenomenon Used In Modern "Black-Outs"

LIGHT STUFF. Street signs and direction markers that glow under invisible light in black-out Europe use an old phenomenon. Fluorescence under ultraviolet light is widely used in theatrical productions for changing costumes and scenery with the flick of a switch. In the new tubular lamps it is used to convert electricity into light more efficiently.

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•First Glances at New Books

Physics

THE DEMONSTRATION LABORATORY OF PHYSICS AT THE UNIVERSITY OF CHICAGO —Harvey B. Lemon and Fitz-Hugh Marshall—*Univ. of Chicago Press,* 127 p., $1.50. How a science museum "grew up" to become a demonstration laboratory for the teaching of physics is described in this new book. It enables teachers in almost any secondary school of the nation to construct their own demonstration apparatus that will rival the much studied working museum in Ryerson Hall on the campus.

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Ethnology

ETHNOBOTANY OF THE HOPI — Alfred F. Whiting—*Northern Arizona Society of Science and Art,* 120 p., $2., paper; $2.25, cloth. (Museum of Northern Arizona, Bulletin 15) The Hopi, like all Indian peoples, use very many plant species for food, medicine, fibers, fuel, etc., as well as in ceremonials. In this bulletin is assembled the completest possible information on nomenclature (both Hopi and European), distribution, cultivation and uses.

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Meteorology

WEATHER GUIDE FOR AIR PILOTS — Elbert Lee Eaton—*Ronald Press,* 74 p., $2. The elements of meteorology simply and briefly presented, including a short non-mathematical outline of the air-mass analysis method. Although specifically intended for the instruction of fliers, this small book can be read with both profit and pleasure by anyone interested in weather—and that includes everyone.

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Zoology

THE CHISEL-TOOTH TRIBE—Wilfrid S. Bronson — *Harcourt, Brace,* 200 p., $2. Rodents, from mice and squirrels to beavers and capybaras, parade through these pages in that happy combination of good natural history and lively, ingenious illustration that constitute the Bronson hallmark. It's a safe prediction that if you start on this book you won't put it aside until you have read every word, and looked at every picture twice.

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Agriculture

VANISHING LANDS, A World Survey of Soil Erosion—G. V. Jacks and R. O. Whyte—*Doubleday, Doran,* 332 p., $4. If it is true that a woman is as old as she looks, it is no less true that a land is as old as it looks. A land wrinkled with erosion is an old land, a land preparing to die. There are too many such wrinkles on the face of our own land today: this book looks at the facts squarely, and as squarely tells what needs to be done about them.

Science News Letter, September 23, 1939

Forestry

THE FOREST MANAGER — Karl Dannecker, translated by Arthur O. Weidelich—*American Forestry Assoc.,* 169 p., $2. If you own a piece of woodland, whether a one-acre woodlot or a 10,000-acre forest, you will need this compact manual of timber management.

Science News Letter, September 23, 1939

Physiology

OSMOTIC REGULATIONS IN AQUATIC ANIMALS—August Krogh — *Cambridge (Macmillan),* 242 p., $4. A full discussion of what is at once one of the most important aspects of physiology and one of the most difficult for most students. For its relatively limited audience this book will have a very strong appeal.

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Zoology

WILD ANIMALS, Great Wild Animal Stories of Our Day—Frances E. Clarke, comp.—*Macmillan,* 335 p., $2.50. A collection of notable stories and articles about animals by well known writers, including Laurence Housman, Herbert Ravenel Sass, William Beebe, Jay N. Darling, Grey Owl, and many others. If you love animals you will want to read this book; if you are not an animal-lover this book will make you one.

Science News Letter, September 23, 1939

Chemistry

THE WAR GASES: CHEMISTRY AND ANALYSIS—Mario Sartori; trans. by L. W. Marrison — *Van Nostrand,* 360 p., $7.50. See SNL, Aug. 26.

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History

THE PASSING OF THE ABORIGINES — Daisy Bates—*Putnam,* 258 p., $3. See p. 200.

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Zoology

THE BOXER—John P. Wagner—*Orange Judd,* 277 p., $3.50. Complete information about a splendid breed of dogs. History of the Boxer, instructions as to care and breeding are clearly given and well illustrated.

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Engineering

RAILROADS AND RIVERS: The Story of Inland Transportation — William H. Clark—*Page,* 334 p., $3.50. Backbone of the development of continental United States has been the railroads and the rivers. Waterways influenced greatly the development of our country east of the Mississippi and the railroads greatly influenced the west. Interesting old photographs and drawings add to the value of this excellent book.

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Medicine

END RESULTS IN THE TREATMENT OF GASTRIC CANCER—Edward M. Livingston and George T. Pack—*Hoeber,* 179 p., $3. See page 201.

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Astronomy

PLANETS, STARS, AND ATOMS — George Edwin Frost—*Caxton,* 287 p., $3. This work has been compiled as a summary of the important fundamentals of astronomy and related science so that it may serve as a handy reference book for teachers in elementary schools and for supplementary reading by their pupils. A glossary of terms, star maps, and an extensive index add to the value.

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Psychology

THE ART OF BEING A PERSON—George Ross Wells—*Appleton-Century,* 300 p., $2.50. See page 204.

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Zoology

FUNDAMENTALS OF ZOOLOGY—William J. Tinkle—*Zondervan,* 492 p., $3. A text by the professor of biology at Taylor University.

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Botany

INTRODUCTION TO FLORAL MECHANISM —S. G. Jones—*Chemical Pub. Co.,* 274 p., $4. A text in plant morphology, emanating from the University of Glasgow, "to provide the elementary student with some introductory knowledge bearing on the application of cyto-genetics to heredity, hybridization and plant breeding."

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Geology

A TEXTBOOK OF GEOLOGY; Part I, Physical Geology (2d ed.)—Chester R. Longwell, Adolph Knopf and Richard F. Flint—*Wiley,* 543 p., $3.75. A revision of the excellent text written in 1932, by three professors of geology at Yale University.

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